

Remarks

Claims 163, 164, 171, 176-179, 183 and 193 are amended herein and new claims 207-210 are added. Upon entry of this amendment, claims 163-210 will be pending.

Rejection under 35 U.S.C. §102

**Claims 171-175**

Claim 171 is amended to further emphasize that each plastic stirrer comprises a **plastic** shaft and a **plastic** mixing blade on the shaft. This amendment clearly distinguishes Applicants' invention as patentable over the prior art of record, including Aldrich.

It will be noted in this regard that Aldrich shows a variety of stirring apparatus having blades that are TEFLON or poly, but Aldrich fails to disclose any stirring apparatus having both a plastic shaft and a plastic mixing blade. More generally, Aldrich fails to disclose any plastic shafts of any kind. For example, pages 2105-2108 of Aldrich show various stirrer shafts made of glass, while failing to disclose any plastic shafts. All other stir shafts disclosed by Aldrich are steel or Teflon-coated steel. Pages 2109 and 2110 disclose agitators formed from Teflon, but each of these agitators must be coupled with a steel or Teflon-coated steel shaft. None of the other references cited by the Office action provide any relevant teaching.

For these reasons, claims 171-175 are believed to be in condition for allowance. Additional patentable elements and combinations of patentable elements are contained in claims 172-175, but these will not be discussed in detail here because they were not specifically rejected in the Office action noted-above.

Rejection under 35 U.S.C. §103

**Claims 163-170**

Claim 163 defines a parallel reactor having vessels with multi-piece spindles for stirring reaction mixtures in the vessels. Each of the multi-piece spindles comprises (a) a metal upper spindle portion, (b) a plastic stirrer comprising a plastic shaft and a plastic mixing blade on the shaft and (c) a coupling for releasably coupling the plastic stirrer to the metal upper spindle portion in a position wherein the stirrer extends down into a respective vessel. Claim 163 also recites that the plastic stirrer is removable from the coupling after a mixing operation to permit replacement of the stirrer.

Nelles and the other references of record fail to disclose these novel features. Nelles discloses a unitary shaft (ruhrerwelle) extending from near the bottom of the vessel, upward through a bushing (lagerbuchse) and then through a series of seals (wellendichtringe), until it finally stops at a coupling (kupplung) well outside the confines of the vessel. (Nelles, p. 715, Fig. 2). A stirring implement attaches to the lower end of the unitary shaft, such that both the shaft and stirring implement are exposed to the reactor contents. Nelles' unitary shaft design fails to teach or disclose a multi-piece spindle having both a metal upper spindle portion and a plastic stirrer. Although Applicants do not have an English translation of Nelles, it appears from the figures that the shaft of Nelles is metallic, due to its great length and small diameter relative to the diameter of the vessel. The diameter of the Nelles vessel is eleven times the diameter of the shaft, which rotates at a speed from 85 to 2100 revolutions per minute. It is likely that such a shaft would need to be formed from a metallic material. Nelles' combination of a stirring implement and a

unitary shaft also fails to teach Applicants' plastic stirrer comprising both a plastic shaft and a plastic mixing blade. The coupling of Nelles also fails to provide adequate teaching of a coupling for releasably coupling a plastic stirrer to a metal upper spindle portion. The unitary shaft of Nelles is coupled to a rotational energy source through the coupling, but this coupling does not permit ready removal of a plastic stirrer after a mixing operation to permit replacement of the stirrer. Such a unitary shaft is not readily replaceable because it passes through multiple bushings and seals before engaging with the coupling external of the vessel. In use, the unitary shaft and stirring implement of Nelles are both fully contaminated by the vessel environment, yet the unitary shaft of Nelles is not apparently removable from the coupling after a mixing operation for replacement. None of the other references relied upon in the Office action disclose the non-obvious combination of features of claim 163.

For these reasons, claims 163-170 are believed to be in condition for allowance. Additional patentable elements and combinations of patentable elements are contained in claims 164-170, but these will not be discussed in detail here because they were not specifically rejected in the Office action noted-above.

#### **Claims 176-178**

Claim 176 defines an apparatus for the parallel processing of reactions mixtures. The apparatus comprises a reactor block having a series of wells therein extending down from an upper surface of the block for containing the reaction mixtures. In addition, an upper plate is removably secured to the reactor block over the upper surface. The upper plate has openings therein in registry with the wells in the reactor block. Stirring mechanisms attach to the upper plate for stirring the reaction mixtures.

Nelles and the other references of record fail to disclose these novel features. Moreover, the Office action fails to specifically point out what reference or references disclose a reactor block having a series of wells and a removable upper plate having openings in registry with the wells as defined by claim 176. As described above, Nelles discloses a single reactor with a rotating shaft and stirring implement. Nelles fails to disclose either a reactor block with wells or an upper plate removably secured to such a reactor block. Corkan discloses an automated chemistry workstation for parallel experimentation. Corkan similarly fails to disclose a reactor block, a removable upper plate or stirring mechanisms as defined by claim 176. Lebl discloses a microtitre block 110 with wells 111 sealed by an inflatable bag 112 held in place by a backing plate 108 (Lebl, Figs. 5A-5C). However, Lebl fails to disclose a removable upper plate having openings in registry with the wells or stirring mechanisms attached to such an upper plate. Salvat and Aldrich similarly provide no teaching of the claimed elements.

For these reasons, claim 176 is believed to be in condition for allowance.

Similarly, claims 177 and 178 recite an apparatus for parallel processing of reaction mixtures comprising a reactor block having a series of wells therein, a removable plate secured to the reactor block having openings therein in registry with the wells and a stirring system attached to the removable plate. For the reasons set forth above with respect to claim 176, claims 177 and 178 are believed to be in condition for allowance.

#### **Claim Groups 179-182, 183-192 and 193-196**

Each claim in claim group 179-182 recites, among other things, a parallel reactor having vessels and multi-piece

spindles, wherein each spindle comprises a plastic shaft and a plastic mixing blade on the shaft, and a coupling for releasably coupling the plastic stirrer to a metal upper spindle portion rotated by a drive system. Similarly, each claim in claim group 183-192 recites, among other things, a parallel reactor comprising vessels for containing the reaction mixtures, plastic stirrers comprising a plastic shaft and a plastic mixing blade on the shaft for stirring the reaction mixtures in the vessels, and a coupling for releasably connecting each stirrer to a drive system. Moreover, each claim in claim group 193-196 recites, among other things, a plastic stirrer comprising a plastic shaft and a plastic mixing blade on the shaft, wherein the shaft has a quick-connect/disconnect element thereon adapted for engagement with a coupling for releasably connecting the plastic stirrer to a drive system.

As discussed above with respect to claim 171, none of the references relied upon by the Examiner in the Office action disclose a spindle or a plastic stirrer comprising a plastic shaft and a plastic mixing blade on the shaft for stirring the reaction mixtures. The references similarly fail to disclose a coupling for releasably connecting/coupling the plastic stirrer.

For these reasons, claims 179-196 are believed to be in condition for allowance.

#### Claims 197-205

Claim 197 defines a combinatorial chemistry reactor system as comprising a reactor block having a series of wells and a removable plate removably secured to the reactor block with openings therein in registry with the wells in the reactor block. The claim further defines seals for sealing the wells and a stirring system supported by the removable plate and removable with the removable plate.

As discussed above with respect to claims 176-178, none of the references of record disclose this unique combination of features. For these reasons, claims 197-205 are believed to be in condition for allowance. Additional patentable elements and combinations of patentable elements are contained in claims 198-205, but these will not be discussed in detail here because they were not specifically rejected in the Office action noted-above.

#### Claim 206

Claim 206 defines a combinatorial chemistry reactor system for parallel processing of reaction mixtures as comprising a reactor block having a series of wells therein extending down from an upper surface of the block and an upper plate removably secured to the reactor block in face-to-face relation with the upper surface. The removable plate has openings therein in registry with the wells in the reactor block. The system further comprises a stirring system supported by the removable plate and removable with the removable plate. The stirring system comprises a drive mechanism comprising a drive train for driving the stirrers and one or more motors for driving the drive train. The stirrers are removably attached to the drive mechanism.

None of the references relied upon in the Office action disclose this unique and non-obvious combination of features. For the same reasons as set forth above with respect to claim 176, claim 206 is patentable because it discloses, among other things, an upper plate removably secured to an upper surface of the reactor block. In addition, none of the references relied upon by the Examiner disclose a drive train for driving multiple stirrers.

For these reasons, claim 206 is believed to be in condition for allowance.

**Non-Statutory Double Patenting Rejection**

Enclosed herewith is a terminal disclaimer disclaiming the portion of any term beyond expiration of U.S. Patent No. 6,306,658. Accordingly, withdrawal of this rejection is requested. Please charge the Terminal Disclaimer fee to Deposit Account No. 50-0496.

**New Claims 207-210**

New claims 207-210 are added to further define Applicants' invention and are submitted as allowable over the prior art.

**Fees for Additional Claims and Extension**

Please charge Deposit Account No. 50-0496 for the additional claim fees in the amount of \$72 and a two month extension in the amount of \$410.00. The Commissioner is hereby authorized to charge any under payment or credit any over payment to Deposit Account No. 50-0496.

Conclusion

In view of the foregoing, favorable reconsideration and allowance of this application is requested.

Respectfully submitted,

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